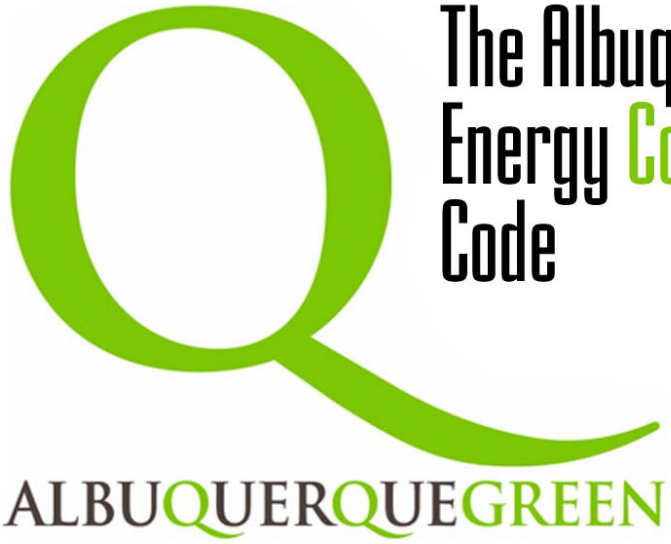

The Albuquerque Energy Conservation Code

Mayor Martin J. Chávez

VOLUME I

COMMERCIAL AND
MULTI - FAMILY
RESIDENTIAL BUILDINGS

PREFACE

The City of Albuquerque, the Mayor's Office and the City Council are pleased to have developed the first comprehensive **Energy Conservation Code** in the State of New Mexico. The 2009 **Albuquerque Energy Conservation Code** reflects a concerted, combined effort between local government and those in the building, and building-related, industries to develop a code acceptable to all. An effective Energy Conservation Code is essential to reduce the amount of greenhouse gases generated by buildings. It is estimated that the building industry generates 39% of carbon dioxide (C02) emissions and 48% of all greenhouse gas (GHG) emissions in the United States.

The 2009 **Albuquerque Energy Conservation Code** is one element of the Mayor's effort to achieve the goals of the 2030 Challenge ensuring new buildings are carbon neutral by the year 2030. Green building standards reduce greenhouse gas emissions by advancing energy efficiency and renewable green energy. Green buildings are cost-effective, provide healthy places for people to live, learn and work while supporting municipal conservation and environmental goals.

The City will be developing incentives through its Green Building Program to encourage building designs that will exceed the level set by the 2009 **Albuquerque Energy Conservation Code**. And, with guidance from the Green Ribbon Task Force, the 2009 **Albuquerque Energy Conservation Code** will be amended, at regular intervals, to keep pace with new energy conservation technologies.

The Mayor and the City Council would like to thank the Green Ribbon Task Force which includes leaders from the design and building industries, as well as others, for working together to craft such a comprehensive energy code. The assistance provided by the Task Force was invaluable.

HOW TO USE
VOLUME I OF THE ALBUQUERQUE ENERGY CONSERVATION CODE

I. **THE 2009 ALBUQUERQUE ENERGY CONSERVATION CODE-VOLUME I ADOPTS AND AMENDS THE 2006 INTERNATIONAL ENERGY CONSERVATION CODE.**

II. **SECTION AND TABLE NUMBERS THAT ARE IDENTIFIED IN THE 2009 ALBUQUERQUE ENERGY CONSERVATION CODE AMEND THE CORRESPONDING SECTIONS AND TABLES IN THE 2006 INTERNATIONAL ENERGY CONSERVATION CODE.**

III. **THE AMENDED PROVISIONS OF THE 2009 ALBUQUERQUE ENERGY CONSERVATION CODE SUPERSEDE THE CORRESPONDING PROVISIONS OF THE 2006 INTERNATIONAL ENERGY CONSERVATION CODE.**

IV. **THE 2009 ALBUOUEROUE ENERGY CONSERVATION CODE MUST BE USED IN CONJUNCTION WITH THE 2006 INTERNATIONAL ENERGY CONSERVATION CODE.**

V. **THE NEW MEXICO ENERGY CONSERVATION CODE IS NOT ADOPTED BY THE CITY OF ALBUQUERQUE.**

CHAPTER 1
ADMINISTRATION

SECTION 101
SCOPE AND GENERAL REQUIREMENTS

101.1 Title. This code shall be known as the Albuquerque Energy Conservation Code-Volume I and shall be cited as such. It is referred to herein as "this code".

101.2 Scope. This code applies to commercial and multi-family residential buildings.

101.3 Intent. This code shall regulate the design and construction of buildings for the effective use of energy. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve the effective use of energy and to reduce greenhouse gas emissions in Albuquerque. This code is not intended to abridge safety, health, or environmental requirements contained in other applicable codes or ordinances.

101.4 Adopted code and referenced standards.

101.4.1 Code. This code adopts, by reference, and amends the 2006 International Energy Conservation Code.

101.4.2 Standards. The standards listed in Chapter 6 of this code shall be considered part of the requirements of this code to the extent that they are referenced.

101.4.3 Conflicting requirements. Where the provisions of this code and the 2006 International Energy Conservation Code or the standards referenced herein conflict, the provisions of this code shall take precedence.

101.5 Validity. If any section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, illegal, or void, such decision shall not affect the validity of the remaining portions of this code. The City of Albuquerque hereby declares that it would have adopted and implemented this code, and each section, subsection, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, and phrases be declared unconstitutional, illegal, or void.

101.6 Applicability.

101.6.1 Existing buildings. Except as specified in this chapter, this code shall not be used to require the removal, alteration, or abandonment of, nor prevent the continued use and maintenance of, an existing building or building system lawfully in existence at the time of adoption of this code.

101.6.2 Historic buildings. Exempt from this code are buildings: (1) listed in the State or National Register of Historic Places: (2) designated as a historic property under local or state designation law or survey; (3) certified as a contributing resource within a national register listed, or locally designated, historic district; (4) that, in the written opinion of the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, are eligible to be listed in the National or State Registers of Historic Places either individually or as a contributing building within a historic district.

101.6.3 Additions, alterations, renovations, or repairs. Additions, alterations, renovations, or repairs to an existing building, building system, or portion thereof, shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portion(s) of the existing building, or building system, to comply with this code. Additions, alterations, renovations, or repairs shall not create an unsafe or hazardous condition or overload existing building systems.

Exception: The following need not comply provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.

2. Glass only replacements in an existing sash and frame.

3. Existing single-rafter roof, wall, or floor cavities exposed during construction provided that these cavities are filled with insulation having a minimum nominal value of R-3.5 per inch of thickness.

4. Construction where the existing roof, wall, or floor cavity is not exposed.

5. Alterations that replace less than 50% of the luminaries in a space need not comply with Section 505 of this code provided that such alterations do not increase the installed interior lighting power.

101.6.4 Change in occupancy. Buildings undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code.

101.6.5 Mixed occupancy. Where a building includes both residential and commercial occupancies, each occupancy shall be considered separately and shall meet the energy conservation requirements for that occupancy.

101.7 Compliance.

101.7.1 Compliance materials. The code official shall be permitted to approve specific computer software, worksheets, compliance manuals, and other similar materials that meet the intent of this code.

10 1.7.2 Low energy buildings. The following buildings, or portions thereof, separated from the remainder of the building by building thermal envelope assemblies

complying with this code shall be exempt from the building thermal envelope provisions of this code:

1. Those with a peak design rate of energy usage less than 3.4 Btu/h x ft^2 or 1.0 watt/ft^2 of floor area for space conditioning purposes.

2. Those that do not use fossil fuels or electricity that is produced from fossil fuels.

3. Those that do not contain conditioned space.

SECTION 102
MATERIALS, SYSTEMS, AND EQUIPMENT

Section 102 of the 2006 International Energy Conservation Code is adopted as written.

SECTION 103
ALTERNATE MATERIALS, METHODS OF CONSTRUCTION, DESIGN, OR INSULATING SYSTEMS

103.1 General. This code is not intended to prevent the use of any material, method of construction, design, or insulating system not specifically prescribed herein, provided that such construction, design, or insulating system has been approved by the code official as meeting the intent of this code.

103.1.1 Above code programs. Buildings designed to obtain LEED Silver certification are deemed to meet the greenhouse gas reduction goals of the City of Albuquerque and to be in compliance with this code provided that such buildings also comply with the mandatory provisions of this code. Applications for a building permit under this program shall include the following:

1. Proof that the project has been registered with the United States Green Building Council (USGBC).

2. A completed LEED Checklist that has been prepared by a LEED Accredited Professional.

3. Energy modeling, as required by the applicable LEED Reference Guide, that has been prepared by a registered design professional.

Buildings permitted under this program are subject to all applicable provisions of the

Albuquerque Uniform Administrative Code and to the inspections listed in Table 105.1 of this code.

SECTION 104
CONSTRUCTION DOCUMENTS

Section 104 of the 2006 International Energy Conservation Code is adopted as written.

SECTION 105
ENERGY CONSERVATION INSPECTIONS

105.1 General. Work that is regulated by this code shall be subject to the inspections listed in Table 105.1.

TABLE 105.1
ENERGY CONSERVATION INSPECTIONS

	COMPONENT	CODE REFERENCES	WHEN INSPECTED
Thermal Envelope	1. Slab Insulation	Section 402.2 of the 2006 IECC and Table 402.1.1 of this code	Foundation Insulation Inspection
	2. Thermal Bypass	*(Intentionally left blank)*	Thermal Bypass Inspection
	3. Frame Insulation	Section 402.2 of the 2006 IECC and Table 402.1.1 of this code	Frame Insulation
	4. Roof Ventilation	Section R806 of the 2006 IRC [a] and Section 402.7 of this code	Building Final
	5. Roof Reflectance	Section 402.8 of this code	Building Final
Air Leakage	1. Building Thermal Envelope	Section 402.4.1 of the 2006 IECC	Thermal Bypass Inspection
	2. Fenestration	Section 402.4.2 of the 2006 IECC	Building Final
	3. Recessed Lighting	Section 402.4.3 of the 2006 IECC	Thermal Bypass Inspection/ Electrical Rough-In
Heating, Ventilating, and Air-Conditioning System	1. Duct Sealing and Support	Sections M1601.3.1 and M1601.3.2 of the 2006 IRC2 and Section 403.4.2 of this code	Below Slab: Duct Groundwork Inspection Above Slab: Heating/Cooling Top-Out
	2. Duct Insulation	Section 403.4.1 of this code	Below Slab: Duct Groundwork Inspection Above Slab: Heating/Cooling Top-Out
	3. Pipe Insulation	Section 403.9.5 of this code	Below Slab: Plumbing Groundwork Inspection Above: Plumbing Top-out
	4. Controls	Section 403.3 of this code	Heating/Cooling Final
Service Water Heating System	1. Pipe Insulation	Section 403.8.5 of this code	Below Slab: Plumbing Groundwork Inspection Above Slab: Plumbing Top-out
	2. Controls	Section 403.8.4 of this code	Plumbing Final
	3. Conservation of Hot Water	Section 403.8.6 of this code	Plumbing Final
	4. Heat Trap	Section 403.8.7 of this code	Plumbing Top-out
Heated Swimming Pools	1. Pipe Insulation	Section 403.8.5 of this code	Pool/solar Heating Rough-In
	2. Energy Source	Section 403.8.2.1 of this code	Pool/Solar Heating Rough-In
	3. Insulating Cover	Section 403.8.2.3 of this code	Pool Final
	4. Controls	Section 403.8.2.2 and 403.8.2.4 of this code	Pool Final
Electrical Lighting	1. Lighting Efficiency	Section 403.9 of this code	Recessed Fixtures: Electrical; Rough-In Surface – Mounted Fixtures and Luminaries: Electrical Final

IECC = International Energy Conservation Code
IRC = International Residential Code

a. IRC references are reprinted in Chapter 7 of this code

CHAPTER 2
DEFINITIONS

Chapter 2 of the 2006 International Energy Conservation Code is adopted as written with the following additions:

AIR-IMPERMEABLE INSULATION. Insulation with air permeability equal to or less than 0.02 L/m^2 at *75* Pa pressure differential tested according to ASTM B 2178 or E 283.

DAYLIGHT ZONE OF SKYLIGHTS. The daylight zone for skylights is the area of the skylight plus 70% of the floor-to-ceiling dimension in all directions from the edges of the skylight.

RECOVERED ENERGY. Is energy used in a building that (1) is recovered from space conditioning, service water heating, lighting, or process equipment after the energy has performed its original function; (2) provides space conditioning, service water heating, or lighting; and (3) would otherwise be wasted.

SUBSTANTIAL ALTERATION. Any alteration where the work area exceeds 50 percent of the aggregate area of the building.

WORK AREA. That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code.

CHAPTER 3
CLIMATE ZONES

SECTION 301
CLIMATE ZONES

301.1 Climate zone. Albuquerque is in Climate Zone 4 and it is in a Dry (B) location.

301.2 Warm humid counties. Albuquerque is not in a warm humid county.

The balance of Chapter 3 of the 2006 International Energy Conservation Code is deleted in its entirety.

CHAPTER 4
RESIDENTIAL ENERGY EFFICIENCY

Chapter 4 of the International Energy Conservation Code is deleted in its entirely. It is replaced by the 2009 Albuquerque Energy Conservation Code- Volume II, One- and Two-Family Dwellings and Townhouses.

CHAPTER 5
COMMERCIAL ENERGY EFFICIENCY

SECTION 501
GENERAL

501.1 Scope. The requirements contained in this chapter are applicable to commercial and multi-family residential buildings, or portions of commercial and multi-family residential buildings.

501.2 Application. The requirements in Sections 502 (Building envelope), 503 (Building mechanical systems), 504 (Service water heating), and 505 (Lighting) of the 2006 International Energy Conservation Code, as adopted and amended by this code, shall each be satisfied on an individual basis.

Exception: Buildings conforming to Section 506 of the International Energy Conservation Code as adopted and amended by this code.

SECTION 502
BUILDING ENVELOPE REQUIREMENTS

Section 502 of the 2006 International Energy Conservation Code is adopted as written with the following modifications:

Table 502.2(1). *Table 502.2 (1) of the 2006 International Energy Conservation Code is replaced by Table 502.2 (1) of this code.*

TABLE 502.2 (1)
BUILDING ENVELOPE REQUIREMENTS - OPAQUE ASSEMBLIES

Item	Component	Requirement (Minimum or Maximum)
Roof	Insulation entirely above deck Metal building (with R-5 thermal blocks) Attic and other Single rafter Solar reflectance Index (SRI): Low Slope[a] Steep Slope[b]	R-25.O ci. R-13 + R-19 R-38 R-38 + R-5 ci. 0.65[c] 0.25[c]
Walls	Mass (HC >7 *BtuIft2)* Metal building Steel framed Wood framed and other Below-grade walls	R-12.5 ci. R-13 + R-13 R-19 + R-5 c.i[d] R-21or R-13 + R-7.5 c.i.[e] R-13 or R-1O ci.
Floors	Mass Steel framed Wood framed and other	R-12.5 ci. R-30 R-30
Slabs	Unheated Heated	R-1O for 24 in. R-1O for 24 in. plus R-5 ci. under slab
Doors - Opaque	Swinging Non-swinging (including roll-up)	U-O.50 U-O.50

ci. = **continuous insulation**

a. Low slope = 2 inches in 12, or less
b. Steep slope = greater than 2 inches in 12
c. Initial solar reflectance as determined by the Cool Roof Rating Council
d. R-19 insulation installed within framing cavity plus continuous foam insulation applied to exterior side of framing
e. R-13 insulation installed within framing cavity plus continuous foam insulation applied to exterior side of framing.

Table 502.2(2). Table 502.2 (2) of the 2006 International Energy Conservation Code is replaced by Table 502.2 (2) of this code.

TABLE 502.2(2)
METAL BUILDING ASSEMBLY DESCRIPTIONS

ROOFS	DESCRIPTION
R-13 + R-19	Filled cavity roof. Thermal blocks are a minimum, R-5 of rigid insulation, which extends 1 in. beyond the width of the purlin on each side, perpendicular to the purlin. This construction is R-1 3 insulation batts draped perpendicularly over the purlins, with enough looseness to allow R-1 9 batt to be laid over it, parallel to the purlins. Thermal blocks are then placed above the purlin/batt, and the roof deck is secured to the purlins. In the metal building industry, this is known as the “sag and bag” insulation system.
WALLS	**DESCRIPTION**
R-13 + R-13	Double insulation layer The first layer of R-13 insulation batts is installed continuously perpendicular to the girts, and is compressed as the metal skin is attached to the girts. The second layer of R-1 3 insulation batts is installed within the framing cavity.

Table 502.3. *Table 502.3 of the 2006 International Energy Conservation Code is replaced by Table* 502.3 of this code.

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS-FENESTRATION

Vertical Fenestration (40% Maximum of Above-Grade Wall)
Framing materials other than metal with or without metal reinforcement or cladding
Maximum U-Factor: 0.30
Metal framing with or without thermal break
Curtain Wall / Storefront Maximum U-Factor: 0.42
Entrance Door Maximum U-Factor: 0.75
All Other [a] Maximum U-Factor: 0.42
Solar Heat Gain Coefficient (SHGC)
All Frame Types / All Orientations Maximum SHGC: 0.38
Projection Factor (PF) [b]
All Frame Types / S,E,W Orientations Minimum PF: 0.5
Skylights (except warehouses and factories)
Maximum Area (percentage of gross roof): 3% Maximum U-Factor: 0.69 Maximum SHGC: 0.34
Warehouse and Factory Skylights
Area (percent of gross roof): 5% Minimum / 7% Maximum [c] Maximum U-Factor: 0.69 Maximum SHGC: 0.39 Minimum Visible Light Transmittance (VLT): 0.59

a. All others includes operable windows, fixed windows and non-entrance doors.
b. See IECC Section 502.3.2
c. Prismatic diffusing skylights required

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502.3.3 Warehouses and factories. (Prescriptive). Warehouse and factory skylights shall comply with Table 502.3. They shall be prismatic diffusing skylights with a minimum haze value of 90% as tested in accordance with ASTM D1003 and shall incorporate internal condensate gutters to collect and dispose of condensation. Skylights shall not be spaced more than 1.4 times the ceiling height apart. In warehouses with tall racking, racking shall be laid out so that aisles are centered below the skylights. Where skylight well height exceeds 2 feet, the skylight opening shall be splayed at a 45 degree angle on all sides. Lighting and lighting controls within the daylight zone of the skylights, as defined in Chapter 2 of this code, shall comply with Section 505.2.2.2.6 of this code.

Exceptions:

1. Warehouses and factories less than 8,000 square feet in area shall not be required to comply with Section 505.2.2.2.6 of this code.

2. Additions less than 8,000 square feet in area shall not be required to comply with Section 505.2.2.2.6 of this code.

3. Alterations, renovations, and repairs to existing warehouses and factories.

4. Refrigerated warehouses.

3. Offices, toilet rooms, and similar spaces that are accessory to a warehouse or factory, provided that such spaces are separated from the warehouse or factory floor by walls or a combination of walls and a ceiling.

5. Spaces having a designed general lighting system with a lighting power density less than 0.5 watts per square foot shall not be required to comply with Section 505.2..2.2.6 of this code.

6. Daylighting of warehouse storage spaces or fabrication areas within factories over 50,000 square feet in area shall be designed to reduce yearly electric lighting consumption by at least 50%.

502.6 Reflectance of interior surfaces. (Prescriptive). Reflectance of interior surfaces shall comply with Table 502.6.

Exceptions:

1. A-1, A-2, and A-4 occupancies as described in the International Building Code.

2. Amusement arcades.

3. Places of religious worship.

4. Funeral parlors.

5. Museums.

6. Pool and billiard parlors.

7. Open parking garages.

8. Dwelling and sleeping units as defined in the International Building Code.

9. U-occupancies as described in the International Building Code.

10. Spaces having a designed general lighting system with a lighting power density less than 0.5 watts per square foot.

TABLE 502.6
REFLECTANCE OF INTERIOR SURFACES

Location	Minimum Reflectance
Ceilings - ducts and/or structure exposed	80%
Ceilings - other	70%
Light wells - ducts and/or structure exposed	80%
Light wells - other	70%
Walls - above 7 ft.	70%
Walls below - 7 ft.	50%
Floors	20%

SECTION 503
BUILDING MECHANICAL SYSTEMS

Section 503 of the 2006 International Energy Conservation Code is adopted as written but with the following modifications.

503.1 General.

503.1.1 Compliance. Mechanical systems and equipment serving the building heating, cooling, or ventilation needs shall comply with Section 503.2 (referred to as mandatory provisions) and either:

1. Section 503.3 (Simple systems) or,

2. Section 503.4 (Complex systems).

503.1.2 Prohibited installations. Electric-resistance heating systems shall not be used for space heating, for reheating of supply air, or for providing warm air in mixing systems.

Exceptions:

1. Where an electric-resistance heating system supplements a heating system in which at least 60 percent of the annual energy requirement is supplied by site-solar or recovered energy as defined in Chapter 2 of this code.

2. Where an electric-resistance heating system supplements a heat pump heating system and the heating capacity of the heat pump is more than 75 percent of the calculated design heating load.

3. Where the total capacity of all electric-resistance heating systems serving the entire building is less than 10 percent of the total design output capacity of all heating equipment serving the entire building.

4. Where the total capacity of all electric-resistance heating systems serving the building, excluding those allowed under Exception 2, is no more that 3kW.

5. Like-for-like replacement in existing buildings not undergoing substantial alterations as defined in Chapter 2 of this code.

503.2.7 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of R-8 insulation when located in unconditioned spaces and when located outside the building. When located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned spaces or exempt spaces by a minimum of R-8 insulation.

Exceptions:

1. When located within equipment.

2. When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15 F (8 C).

The remainder of Section 503.2.7 of the 2006 International Energy Conservation Code remains unchanged

SECTION 504
SERVICE WATER HEATING
(Mandatory)

Section 504 of the 2006 International Energy Conservation Code is adopted as written but with the following modifications:

504.5 Pipe insulation. For automatic-circulating hot water systems, piping shall be insulated to a minimum R-4 for piping two inches, or less, in diameter and to a minimum of R-6 for piping greater than two inches in diameter. The first 8 feet of piping in non-circulating systems served by equipment without integral heat traps shall be insulated to a minimum of R-4 for piping two inches, or less, in diameter and to a minimum of R-6 for piping greater than two inches in diameter.

504.7.1 Pool heaters. The primary source of energy for heating swimming pools shall come from solar collectors. All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Supplemental pool heaters fired by natural gas shall not have continuously burning pilot lights.

504.7.2 Spas and hot tubs. The walls and undersides of spas and hot tubs heated to more than 90 degrees Fahrenheit shall be insulated on the exterior side with approved insulation having a minimum insulation value of R-12.

SECTION 505
ELECTRICAL POWER AND LIGHTING SYSTEMS

Section 505 of the 2006 International Energy Conservation Code is adopted as written but with the following modifications and additions:

505.1 General. This section covers lighting system controls, the connection of ballasts, the maximum lighting power for interior applications, and minimum acceptable lighting equipment for exterior applications.

Exception: Lighting within dwelling units shall comply with the 2009 Albuquerque Energy Conservation Code-Volume II, One- and Two-Family Dwellings and Townhouses.

505.2.2.2.3 Occupancy sensor controls. (Prescriptive). Occupancy sensors shall be installed in the following locations:

1. Offices less than 250 square feet in area.
2. Classrooms and lecture halls of any size.
3. All non-sales rooms in retail buildings
4. Warehouses and self-storage buildings
5. Lecture, training, or vocational rooms less than 1,000 square feet in area.
6. Employee lunch and break rooms.
7. Rooms used for document copying and printing.
8. Restrooms.
9. Dressing, locker, and fitting rooms.
10. Storage and supply rooms less than 1,000 square feet in area.
11. Multipurpose rooms less than 1,000 square feet in area.
12. Conference and meeting rooms less than 1,000 square feet in area and located in hotels and convention centers.

Exceptions:

1. Spaces with multi-scene lighting control systems.
2. Shop and laboratory classrooms.
3. Spaces where an automatic shutoff would endanger the safety or security of the room or building occupant(s).

4. Lighting required for 24-hour operation.

505.2.2.2.4 Occupancy sensor function. Occupancy sensor controls shall be "manual On" and "automatic Off".

Exceptions: "Automatic On" shall be permitted in the following locations:

1. Public corridors and stairwells.

2. Restrooms.

3. Primary building entrance areas and lobbies.

4. Areas where "manual On" operation would endanger the safety or security of the room or building occupant(s).

505.2.2.2.5 Occupancy sensor controls with multi-level switching or dimming. **(Prescriptive).** The lighting in the following areas shall be controlled by an occupant sensor with multi-level switching or dimming that reduces lighting power a minimum of 50% when no persons are present:

1. Hotel and motel hallways.

2. Commercial and industrial storage stack areas.

3. Library stack areas.

505.2.2.2.6 Daylight harvesting in warehouses and factories. (Prescriptive). Lighting within the daylight zone of skylights in warehouses and factories, as required by Section 502.3.3 of this code, shall have automatic controls that dim, or multi-level switch, lighting in response to available daylight. Electric lights shall be calibrated to dim or switch when the combined daylighting and electric lighting exceeds 1.20 times the designed light level. The control system and/or photosensor shall include a five-minute time delay or other means to avoid cycling caused by rapidly changing sky conditions.

505.2.2.2.6.1 Dimming controls. For dimming systems, ballasts shall dim down to at least 20% of full output. Photosensors shall include a one-minute fade rate to change light levels and dimming shall be slow, smooth, and linear.

505.2.2.2.6.2 Multi-level switching controls. For multi-level switching systems, luminaires shall have two-lamp, tandem-wired ballasts. Circuit switch legs to luminaires shall be capable of multi-level daylight control to provide 100% / 50% / 0% or 100% / 66% / 33% light levels.

505.2.2.2.6.3 Photosensors. Photosensor systems shall be open-loop. Photosensors shall not be readily accessible and, where possible, photosensors shall be located inside of skylight wells. Photosensors in high-rack areas of warehouses shall be calibrated separately from photosensors in open areas.

505.5.1.4 Linear fluorescent lamps. Linear fluorescent lamps shall be high-performance T5HO or T-8 lamps with high-performance electronic ballast.

Table 505.5.2. Table 505.5.2 of the 2006 International Energy Conservation Code is replaced by Table 505.5.2 of this code

TABLE 505.5.2
INTERIOR LIGHTING POWER ALLOWANCES

Building Area Type[a]	Lighting Power Density (W/ft^2 Maximum)
Automotive Facility	0.8
Convention Center	1.1
Court House	1.1
Dining: Bar Lounge/Leisure	1.2
Dining: Cafeteria/Fast Food	1.3
Dining: Family	1.44
Dormitory	0.9
Exercise Center	0.9
Gymnasium	1.0
Health Care-Clinic	0.9
Hospital	1.1
Hotel	0.9
Library	1.2
Manufacturing Facility	1.2
Motel	0.9
Motion Picture Theater	1.1
Multi-Family	0.63
Museum	1.0
Office	0.9
Parking Garage	0.27
Penitentiary	0.9
Performing Arts Theater	1.44
Police/Fire Station	0.9
Post Office	1.0
Religious Building	1.2
Retail	1.3
Additional LPD for adjustable lighting equipment that is specifically designed and directed to highlight merchandise and is automatically controlled separately from the general lighting	0.4 (spaces not listed below) 0.6 (sporting goods & small electronics) 0.9 (furniture, clothing, cosmetics, and artwork) 1.5 (jewelry, crystal, china)
Sources	Halogen IR or CMH
School/University	0.9
Sports Arena	1.0
Town Hall	1.0
Transportation	0.9
Warehouse	
Bulky and Self-Storage	0.6
Fine Storage	0.85
Workshop	1.26

a. In cases where both a general building area type and a more specific building area type are listed, the more specific building area type shall apply.

Table 505.6.2. Table 505.6.2 of the 2006 International Energy Conservation Code is replaced by Table 505.6.2 of this code.

TABLE 505.6.2
LIGHTING POWER DENSITIES FOR BUILDING EXTERIORS

APPLICATIONS I	LIGHTING POWER DENSITIES
Tradable Surfaces (Lighting Power Densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs, and outdoor sales areas may be traded.)	
Uncovered Parking Areas	
Parking Lots and Drives	0.13 W/ft^2
Building Grounds	
Walkways less than 10 feet wide	1.0 watts/linear foot
Walkways 10 feet wide or greater, plaza areas and special feature areas	0.2 W/ft^2
Stairways	1.0 W/ft^2
Buildings Entrances and Exits	
Main Entries	30 watts/linear foot of door width
Other Doors	20 watts/linear foot of door width
Canopies (free-standing and attached) and Overhangs	
General	1.25 W/ft^2
Warehouses and self-storage buildings	0.5 W/ft^2
Entry Canopies	0.4 W/ft^2
Sales Canopies	1.0 W/ft^2
Outdoor Sales	
Open Areas (including vehicle sales lots)	0.5 W/ft^2
Street frontage for vehicle sales lots in addition to “open area” allowance	20 watts per linear foot
Nontradable Surfaces (Lighting Power Density calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the Tradable Surfaces section of this table.)	
Building Facades	0.2 W/ft^2 for each illuminated wall or surface or 5.0 Watts/linear foot for each illuminated wall or surface length
Automated teller machines and night depositories	270 watts per location plus 90 watts per additional ATM per location
Entrances and gatehouse inspection stations at guarded facilities	0.75 W/ft^2 of covered and uncovered area
Loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.5 W/ft^2 of covered and uncovered area
Drive-up windows at fast food restaurants	400 watts per drive-through
Parking near 24-hour retail entrances	800 watts per main entry

SECTION 506
TOTAL BUILDING PERFORMANCE

Section 506 of the 2006 International Energy Conservation Code is adopted as written with the following modifications and additions:

506.1 General. The proposed design complies with this section provided that:

1. Sections 502.4, 502.5, 503.2, 504, 505.2, 505.3, 505.4, 505.6, and 505.7 of the 2006 International Energy Conservation Code, as adopted and amended by this code, are each satisfied; and either

    (a) the annual energy costs of the proposed design do not exceed those of a standard design complying with the 2006 International Energy Conservation Code, as amended by this code; or

    (b) the annual energy costs of the proposed design are 30% less than a standard design complying with the unamended minimum requirements of the 2006 International Energy Conservation Code.

2. Annual energy costs for the proposed design are determined in accordance with Section 506.3 and annual energy costs for the standard design are determined in accordance with Section 506.4.

3. The energy analyses and supporting documentation are prepared by a registered design professional.

CHAPTER 6
REFERENCED STANDARDS

Chapter 6 of the 2006 International Energy Conservation Code is adopted as written.